DOCUMENT RESUME

ED 212 474 SE 036 084

TITLE You Can Count on Mathematics: Developing Awareness and Mastery. Parent Participation - A Formula for Success.

INSTITUTION Indiana State Dept. of Public Instruction, Indianapolis. Div. of Reading Effectiveness.

PUB DATE Aug 81

NOTE 44p.

EDRS PRICE MF01/PC02 Plus Postage.

DESCRIPTORS Basic Skills; Elementary Secondary Education; Instructional Materials; *Learning Activities; Mathematical Concepts; *Mathematics Education; Mathematics Instruction; *Parent Child Relationship; *Parent Participation; *Parent Student Relationship; Preschool Education; Reference Materials; Resource Materials

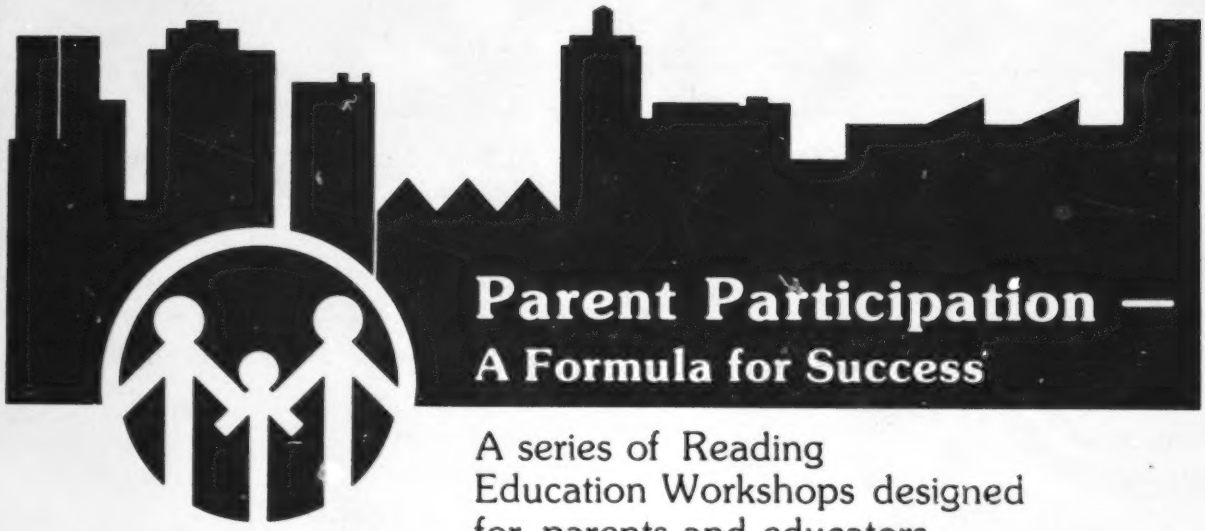
IDENTIFIERS *Mathematics Skills

ABSTRACT

Designed to help parents teach their children some of the basic skills of mathematics, this guide provides numerous mathematics activities and suggests children's books that combine both mathematics and reading skills. It is felt that mathematics has a part in any occupation or hobby, and parents have a great deal of impact on children's mastery of this subject. The material is divided into sections that go from preschool through grade 2, grades 3 through 6, and grades 7 through 12. The document concludes with a brief bibliography of suggested resources for adults, and a summary that speaks of parents as valuable resources for their child's classroom teacher. The view expressed is that parents who create a positive home environment, remain aware of their child's interests, communicate and share with their children, will also share in the growth, success, and progress their child experiences. (MP)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED212474



Parent Participation — A Formula for Success

A series of Reading Education Workshops designed for parents and educators

You Can Count on Mathematics: Developing Awareness and Mastery

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

B. R. Johnson

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Indiana Department of Public Instruction
Harold H. Negley, Superintendent

SE 036 084

POLICY NOTIFICATION STATEMENT

It is the policy of the Indiana Department of Public Instruction not to discriminate on the basis of race, color, religion, sex, national origin, age or handicap, in its educational programs or employment policies as required by the Indiana Civil Rights Act (I.C. 1971, 2291), Public Law 218 (I.C. 1971 Title 20), Titles VI and VII (Civil Rights Act 1964), the Equal Pay Act of 1973, Title IX (1972 Education Amendments), and Section 504 (Rehabilitation Act of 1973).

Inquiries regarding compliance with Title IX and Section 504 may be directed to Joyce Stout, personnel director, Indiana Department of Public Instruction, 229 State House, Indianapolis, IN 46204, 317/927-0158, or to the Director of the Office for Civil Rights, Department of Education, Washington, D.C. -- HAROLD H. NEGLEY, STATE SUPERINTENDENT OF PUBLIC INSTRUCTION

Parent Participation -

A Formula for Success

YOU CAN COUNT ON MATHEMATICS:

DEVELOPING AWARENESS AND MASTERY

Division of Reading Effectiveness
Indiana Department of Public Instruction
Harold H. Negley, Superintendent
August 1981

Foreword

As a parent, you play a vital role in your child's learning experience. You are your child's first teacher. The attitudes you develop in your child throughout the preschool and school-age years influence your child's success.

The Indiana Department of Public Instruction has long recognized this important parent role and has attempted to give assistance through its parent participation programs. Having addressed the area of reading for several years, we are pleased, now, to include mathematics in our basic skills efforts for parents. To assist you in helping your child, we have prepared this booklet which provides numerous mathematics activities, along with suggested children's books which combine both math and reading skills.

It is hoped that, through your involvement, your child will actually have fun with mathematics by sharing time together in activities in which your child can easily achieve success. Then you, too, will succeed--you will have shared, with your child, the job of learning.

Harold H. Negley
State Superintendent

Acknowledgment

Appreciation is expressed for the hard work of the Indianapolis Public School System in general and the Indianapolis Public School teachers in particular who developed a set of activity calendars for parents. These calendars were a valuable resource in the preparation of this booklet, providing a large quantity of the simple activities.

The following teachers, under the supervision of Mrs. Evelyn Mason, Language Arts, Supervisor, K6, were responsible for developing the Activity Calendars for parents.

Harriet Schwomeyer

Marva Chubb

Ladye Hazelwood

Nancy Defibaugh

Joy Sullender

Sue Carol Miller

Carol Inabnit

Table of Contents

	Page
Foreword	iii
Acknowledgement	v
Introduction	1
Awareness and Mastery: Preschool through Grade 2	5
Awareness and Mastery: Grades 3 through 6	19
Awareness and Mastery: Grades 7 through 12	33
Resources for Adults	41
Summary	44
Evaluation Sheet	

Introduction

Surely, everyone would agree that mathematics plays a very important role in our world today. Granted, it has gained a reputation for being somewhat difficult to master, but it is important to master it since mathematics has a part in any occupation or hobby.

As parents, you have a great deal of impact on your child's mastery of the subject of mathematics. Even at a very early age your children are able to use simple mathematical ideas, and you can increase their chances of success by providing suitable activities to develop those ideas. In addition, your attitudes toward mathematics are going to have a direct influence on the attitudes of your children toward the subject.

In this booklet we are going to try to provide some help in the way of activities. Then as your child progresses from the concrete (physical objects) to the pictorial (drawings of the objects on paper) to the symbolic (numerals representing amounts) you will be able to participate more fully in your child's learning experience. Each of the following sections, then, contains some general mathematics activities related to the indicated grade levels and a list of appropriate books for children to read. These books, while being generally fun to read in a story book sense, deal with some basic mathematics ideas important for mastery of the subject. It should also be noted that these books can be found in the children's book section of any drug store, book store, etc. It should not be necessary to find an educational book store since the primary purpose of these books is entertainment.

Section 1 provides suggestions for children in preschool through second grade. Children in this range are relying heavily on concrete representations to give them information. They are gathering a lot of visual information about sizes, shapes, and quantities. By the second grade, many children will be using some symbolism, but working with physical objects will still be extremely important. In this section, then, an emphasis will be placed on counting strategies, awareness of amounts of things, and developing problem solving abilities.

In Section 2, suggestions will be made for children in the third through sixth grades. Throughout this stage of development, children are relying, more and more, on pictorial and symbolic representations of problem situations. They are concentrating on memorization of basic facts, understanding computational processes, and everyday problem-solving situations. Here you will be encouraged to reinforce concepts, help your children begin to deal with abstractions, and give them opportunities to see the relevance of problem solving in everyday life.

The suggestions in Section 3 are aimed at children in grades seven through twelve. By this time, children have been exposed to the majority of ideas, basic to the mastery of mathematics and are going to be working on reinforcement and extension of those ideas. Practically everything will be symbolic and a great deal of abstraction will be developed with the introduction of algebraic concepts. Therefore, these activities may cover any and all mathematics topics and will continue to emphasize the need for mathematics in the real world.

In addition, there is a final section listing some resources for adults. These publications may help parents to get some background in the terminology and symbolism in mathematics and should be obtainable at most bookstores.

With reference to the activities in this booklet or any others you may choose to use, remember to keep it light. This type of activity must be fun for the child. Remember also to keep it brief. Attention spans of children are very short, even when the activity is fun, so let their interest dictate the amount of time used. This also means the directions should be easy to understand and the activity simple to learn. Another thing to remember is to keep it positive. Children can be praised, even with a hug. This will create a more positive attitude toward mathematics. So don't be afraid to use games that involve some chance. It's a great thrill for a child to win when Mommy and Daddy are playing. Finally, remember to be patient. Don't hesitate to repeat a question or explain an idea one more time, giving your child time to think. Who knows, you might even improve your own skill in mathematics as you help your children.

AWARENESS AND MASTERY RESOURCES

PRESCHOOL THROUGH GRADE 2

General Activities

Remember that children at these levels are getting a lot of information visually. They need concrete objects or at least pictorial representations to work with. The emphasis here is on numbers, sizes, shapes, measurements, and developing problem-solving abilities.

Numbers, Numeration, and Counting

1. Have your child count the days on the calendar. See how far he/she can count.
2. While going for a ride, have your child find 5 red cars.
3. Have your child count the four sides of the doors in your house.
4. Get out your pin cushion. Ask your child to stick in a group of 5, 4, 3, 2 and 1. Use this for adding and subtracting numbers up to 5.
5. Put six marbles in a small box or can. Shake it and see if your child can guess the number in the can. Then let your child count them. Repeat using fewer marbles each time.
6. On a trip to the store, have your child count the stop signs he/she sees.
7. Take your child outside. Have him/her find 6 sticks, 7 pebbles, 6 leaves, and 7 seeds.
8. Ask your child which is more: 7 or 6, 3 or 2, 9 or 5. Ask which is less: 7 or 2, 3 or 9, 8 or 12.
9. Tell your child a number between 1 and 10. Have him/her clap that number of times.
10. Give your child a grocery receipt. Have him/her circle all the 9's.
11. How many kinds of animals live on your block?
12. Write the numeral 10 on a paper. Draw groups of 10. Count your toes and fingers.

13. Get a deck of cards. Have your child put all of the same numerals together and arrange them in order.

14. Have your child look at the calendar and count the days in the month.

15. Have your child count the number of times he/she can hop on one foot before losing balance.

16. Write the numerals 1-10 in the bottom of an egg carton. Give your child dry beans and have him/her put the correct number of beans in each section. Include zero (0).

17. Write numerals 1-20 on cards. Deal all cards among players. In turn each player places one card face up on the table. The person having the card with the greatest number takes the cards. First out wins.

18. Help your child find his/her first name in the phone book on a certain page. How many? _____

19. Help your child find and circle the birthdays of all family members on a calendar.

20. While riding or walking outside, have your child look for a street sign with number 1. Find another sign with the number 2. Continue looking for succeeding numbers.

21. Count backwards from 20-1 with your child. Take turns. Let your child say a number, then you say the next.

22. Remove one page from a newspaper section. Have your child write what page number is missing.

23. Give your child a cup with 18 small counters (objects). Have him/her group 10 objects on the left side of the table. Then put 5 counters in a row on the right. Then say "1 ten 5 ones means 15". Continue, adding one counter at a time to 18.

24. Show your child 2 dimes and have him/her count out pennies of equal value. Repeat with nickels and quarters.

25. Count backwards from 50-20 with your child. Take turns. Say one number and let your child say the next.

26. Play a board game (Trouble, Candyland) with your child.

27. Make a flag. Have your child count the stars and stripes. Then write two sentences telling how many there are of each.

28. Have your child jump rope and count the times he/she jumps without missing. Then, you jump. Compare to see who is the winner.

29. Make a cherry pie. Have your child count the number of people who will eat pie. Help him/her cut the pie into that many equal parts. Ask your child the name of the parts. Example: 1/4, 1/6.

30. Take your child to the bank with you. Give him/her a dollar and a quarter. Have him/her ask the teller to change the dollar into dimes and the quarter into pennies. At home practice counting the dimes by 10's and the pennies by ones.

31. Have your child unscramble these number words and tell you what they are.

reeth	wetlve	rouf
levene	wot	ent
eithg	neo	vief
neves	enin	sxi

32. Have your child unscramble these number words and tell you what they are.

tirthy	tixsy
ortfy	setveny
tiffy	heigty
wentty	tineny
ent	

Have him/her put these in order.

33. Play dominoes with your child. Match equal number of dots. If you like, you can purchase one for children with the dots plus number words and numbers.

34. Draw a birthday cake with 3 candles.

35. Play hopscotch on the sidewalk or driveway with your child. More than two can play, so he/she can invite a friend.

Operations With Numbers

1. Give your child 3 spoons to count. Then give him/her 4 more. Have your child tell how many spoons he/she has in all.

2. Practice subtraction with your child using household objects. Begin with six and take various numbers away.

3. Have your child count different kinds of toys and add them together. Example: One ball and 2 trucks are _____. One dish and 3 dolls are _____.

4. Write 0-5 twice on egg carton cups. Place 2 buttons in the carton. Close it and have your child add the two numbers indicated by the buttons.

5. Give your child 10 counters (objects). Have him/her make 2 equal groups on the table. Then have him/her make 2 groups where the second one has 1 more counter than the first. Repeat moving the counter each time.

6. Have your child make up 3 stories like this: "Bob had 4 candy bars. Sue gave him 1 more. Now Bob has 5 candy bars."

7. Write "I love you" on a note to your child. Have him/her count the letters in each word; then add. Write the answer.

8. Make flash cards like this to the sum of 10.

$$\begin{array}{cccc} 1 & 2 & 3 & 8 \\ \underline{+1} & \underline{+2} & \underline{+2} & \underline{+2} \end{array}$$

Let your child write the answers on the back.

9. Have your child work these problems.

$$\begin{array}{ccccc} 5 & 3 & 2 & 4 & 6 \\ \underline{-1} & \underline{-1} & \underline{-1} & \underline{-1} & \underline{-1} \end{array}$$

He/she may use counters. (Example: bottle caps, spoons, spools)

10. Give your child one piece of candy. Have him/her write:

$$\begin{array}{r} 0 \\ +1 \\ \hline 1 \end{array}$$

Then put that one on the table. Give one more. Have him/her write:

$$\begin{array}{r} 1 \\ +1 \\ \hline 2 \end{array}$$

Continue until he/she has seven candies.

11. Pop some popcorn. Give your child 10 corn kernels. Let him/her eat one and say: "10 minus 1 equals 9." Repeat with "9 minus 1 equals 8" ...until all popcorn is eaten.

12. Help your child tell and write 5 addition stories like this:

"I see 6 lions in a cage. Here come 2 more. Now there are 8. Write:

$$\begin{array}{r} 6 \\ +2 \\ \hline 8 \end{array}$$

13. Draw 10 smiley faces on a strip of paper. Have your child fold back 2. Tell how many are left? Continue to show: 10-3, 10-5, 10-1, etc.

14. Point to 6 on the clock face. Have your child add the numbers on either side. Repeat with other numbers.

15. Give your child 12 counters. Have your child show and write subtraction facts for 12.

16. Have your child write the addition facts to show the sum 15.

17. Have your child choose two numerals from the TV channel selector and add them. Repeat as often as you want.

18. Give your child 7 carrot sticks. Let him/her eat 3. Ask how many are left? Then eat 2. Ask how many are left? Repeat.

19. Write the numeral 18. Have your child subtract his/her age from this number. Repeat using the ages of other children.

20. Give your child 15 pennies. Have your child pitch them at an open box (or hat) about 3 feet away. When all are pitched, have your child write a subtraction problem to tell what happened.

21. Help your child write his whole name. Write how many letters in the first name _____
middle name _____
last name _____
How many in all? _____

Repeat for other family names.

22. Remove the face cards from a deck of cards. Place the remaining cards face down. Have your child choose 2 and add the numbers. Repeat several times.

23. Have your child copy the last 2 digits from an auto license plate and subtract the smaller from the larger. Use other digits in the license number for repeating this process.

24. Write numerals 0-5 in the sections of an egg carton. Have your child pitch 2 pennies into the carton. He/she must add the 2 numbers on which the pennies land.

25. Ask your child to count the children and the adults in the home. Then, subtract the smaller number from the larger number. Do you have more children or more adults in the home?

26. Remove the face cards and 10's from a deck of cards. Play a game. Let your child draw 2 cards and add them. Then you do the same. Continue and see who has more sums.

27. Have your child go on a "shopping trip" using a catalog or newspaper advertisement. Cut out and label the cost of each item, then add the total cost of all items.

28. Have your child count the number of males and females in the family. Add the number together.

29. Have your child subtract his/her age from his/her weight.

30. Use scrap paper (paper bags) to make flash cards, number from 1 to 11. Add all the odd numbers together. Then add the even numbers.

31. Have your child count by 2's. Then ask him/her to count the sections in a carton of eggs by two.

Geometry

1. Find 3 jars with lids. Have your child find the largest lid and the largest jar. Then find the lid for each jar.

2. Give your child your keys. Have him/her find the smallest. Find a key to fit the front door lock.

3. Find several sticks. Have your child find the shortest until they are all gone. Then arrange them in a row from the shortest to longest.

4. This box is a square . Have your child count the sides and the corners. Then find 8 square objects in the house.

5. Give your child some yarn or string. Have him/her outline the 4 basic shapes (circle, square, triangle, rectangle).

6. Give your child 3 pieces of string cut at different lengths. Have him/her tell which is longest; which is shortest.

7. Take your child for a brisk walk around the block. When you return, tell him/her you walked a square and why it is called a square.

8. Have your child stack a saucer, salad plate, and dinner plate in order in the same stack according to size.

Measurement

1. Use string to measure a table, chair, window, pillow, etc. Find the largest, smallest, tallest object in the room.

2. Have your child make a clock face to show what time a favorite show comes on.

3. Have your child measure the length of his/her foot, hand, finger with a ruler. Measure those of other family members.

4. Have your child sing the days of the week to the tune of "Yankee Doodle". Let him/her try it with another tune. Repeat with months of the year.

5. Help your child name some items usually sold by the cup, pint, quart, gallon, half-gallon, liter and dozen. Example: eggs, milk, soda, berries, vinegar.

6. Help your child measure the height of each member of the family. Then tell him/her to place them in order of tallest to shortest and label them first, second, etc.

7. Have your child watch the clock and write down what he/she is doing every half-hour from now until bedtime.

8. Ask your child to walk across a room and measure it in paces. Then ask him/her to guess how many feet there are. After he/she guesses, measure the floor with him/her using a foot ruler.

9. Have your child make a clock out of a paper plate. Ask him/her to draw hands on the clock showing the time that he/she would like to get up on Saturday.

Problem Solving

1. Have your child find several solutions for this problem. What would you do if you got lost at a shopping center?

2. Take the numbers 1-5 and mix them up. Ask your child to arrange them in order.

3. Put number cards in a row. Take one card away, and ask your child to name the missing number.

4. Get out cooking utensils, boxes, cans, and silverware. Mix them up. Have your child arrange like things together.

5. Walk around the block to look at houses. How many houses are brick? How many are frame? Count the houses that have two floors.

6. Arrange the numerals 1-20 like a train. Ask your child to find the number before ___ and after ___; and between ___ and ___.

7. Put a dime, nickel, penny, quarter, and dollar in a row on the table. Give your child one-, two-, and three-step directions. Example of three-step: Point to the nickel, the dollar and then the dime.

8. Make a card for each number 0-20. Scramble them face down on a flat surface. Give your child 3 minutes to turn them over and arrange in order 0-20.

9. Write the following on paper.

1	2	3	4	5
	7	8	9	
		13		
16				

Have your child fill in the missing numbers. Repeat with other numbers.

10. Tell your child, "Write your birthdate," "How old are you now?" _____. "How old will you be after your next birthday?" _____.

11. Give your child a magazine or catalog with pictures. Have him/her circle all the toys and put an x on all the clothes.

12. Give your child an old calendar page. Help him/her cut it apart and scramble the squares. Let the child arrange in order.

13. Call out numbers 1-12, and have your child find each on the clock face.

14. Draw a clock face. Leave out some of the numbers. Have your child write in the missing numbers. Have him/her draw hands to show 5:00.

15. Scramble a set of cards numbered 59-80. Have your child see how fast he/she can put them in order.

16. Have your child count the number of people in the family and set the table for dinner, giving each person one of each item.

17. Make out your grocery list. Have your child check the cost of each item in the food section of the newspaper and jot it down.

18. Have your child collect different sets in your house and place them on the table. Example: salt and pepper shakers, dishes, jacks, etc.

19. Have your child read these stories. Then ask him/her to solve the problem.
    a. Mary had 5¢. Her mother gave her a dime. How much money did she have then?
    b. Mary spent 8¢. How much money did she have left?

Children's Books - Preschool through Grade 2

Numbers, Numeration, and Counting

1. Allen, Robert. Numbers. Illustrated by Mottke Weisman. New York: Platt and Mink, 1968. (Color photographs of objects from child's environment to illustrate one through ten.)

2. Anno, Mitsumasa. Anno's Counting Book. Cleveland: Collins-World, 1970. (Counting from 1 to 15.)

3. Carle, Eric. 1, 2, 3 To the Zoo. Cleveland: Collins-World, 1968. (Counting from 1 to 10.)

4. Carle, Eric. The Rooster Who Set Out to See the World. New York: Franklin Watts. 1972. (Picture book of rooster who collects animals on his walk. Each group is added to the others in small pictures near text. When night arrives each group leaves.)

5. Carle, Eric. The Very Hungry Caterpillar. Cleveland: Collins-World, 1970. (Counting from 1 to 15.)

6. Feelings, Muriel. Moja Means One. Illustrated by Tom Feelings. New York: Dial Press, 1971. (Numbers from 1 to 10 given in Swahili. Illustrations of African scenes depict a set of objects for each number.)

7. Gag, Wanda. Millions of Cats. New York: Coward, 1928. (Intuitive approach to relative values of large numbers.)

8. Gretz, Susanna. Teddy Bears 1 to 10. Chicago: Follet Publishing Company, 1969. (Counting from 1 to 10.)

9. Hoban, Tana. Count and See. New York: MacMillan Publishing Company, 1972. (Black and white photographs of city scenes. Numeral, number name, set of dots and picture for 1 through 20, then 30, 40, 50, and 100.)

10. Little, Mary E. 1, 2, 3 For the Library. New York: Atheneum, 1974. (Numerals and squares keep track of total number of children as they arrive for story hour at the library.)

11. Livermore, Elaine. One to Ten, Count Again. Boston: Houghton Mifflin Company, 1973. (Children count animals in delicate line drawings.)

12. Maestro, Giulio. One More and One Less. Illustrated by Giulio Maestro. New York: Crown Publishers, 1974. (Adding one and subtracting one shown through comic pictures of animals.)

13. Oxenbury, Helen. Numbers of Things. New York: Franklin Watts, Inc., 1968. (Counting from 1 to 10 and 20 to 50.)

14. Wildsmith, Brian. Puzzles. New York: Franklin Watts, Inc., 1970. (Discrimination and counting to 12.)

Geometry and Measurement

1. Epstein, Sam and Beryl. Who Needs Holes? Illustrated by Tomie De Paola. New York: Hawthorne Books, Inc., 1970. (Discussion of circles.)

2. Froman, Robert. Bigger and Smaller. Illustrated by Giolia Fiammenghi. New York: Thomas Y. Crowell Company, 1971. (Demonstrates the relativity of words like big and small.)

3. Kohn, Bernice. How High Is Up? Illustrated by Jan Pyk. New York: G. P. Putnam's Sons, 1971. (Presents meanings of high, low, bottom, big, small.)

4. Podendorf, Illa. Shapes, Sides, Curves, and Corners. Illustrated by Frank Rakoncay. Chicago: Children's Press, 1970. (Two-dimensional shapes shown in three-dimensional objects - cones, cubes, spheres, and cylinders. Relates nature, art and math.)

Problem Solving

1. Anno, Mitsumasa. Topsy-Turvies. New York: Weatherhill, 1970. (Mathematical impossibilities, optical illusions, and pictures to identify what is wrong. Very motivating.)

2. Anno, Mitsumasa. Upside-Downers. New York: Weatherhill, 1971. (Picture puzzles which require visual discrimination and changing perspective.)

3. Charosh, Mannis. Mathematical Games for One or Two. Illustrated by Lois Ehlert. New York: Thomas Y. Crowell Company, 1972. (Mathematical puzzles and games to play with cards, checkers, and marbles. Reinforces addition and subtraction facts and introduces strategy of game playing.)

4. Lexau, Joan M. Archimedes Takes a Bath. Illustrated by Salvatore Murdocca. New York: Thomas Y. Crowell Company, 1969. (A humorous account of Archimedes making a great discovery while taking a bath.)

5. Peppe, Rodney. Odd One Out. New York: Viking Press, 1974. (Discrimination exercise using big, colorful pictures with something wrong in each.)

AWARENESS AND MASTERY RESOURCES

GRADES 3 THROUGH 6

General Activities

Do not forget that children at this stage of development are beginning to use a lot more symbolism and pictorial representations. They also should be mastering the basic facts and applying them to problem-solving situations. These activities will provide for some practice with numbers and counting, operations with numbers, geometry and measurement, and various problem-solving experiences.

Numbers, Numeration, and Counting

1. Have your child count the items in the bedroom that touch the floor.
2. Ask your child to write his/her address in number words. Example: 2605. Two thousand six hundred five; then age, weight, and phone number.
3. Have your child count the number of radio or TV commercials on one show.
4. Have your child guess how many windows, drinking glasses, spoons, and pillows are in the house. Next count each and compare answers.
5. Have your child help you serve the meal by dividing the portions of food evenly among those eating about the same amount.
6. Cut pictures from magazines or newspapers. Have your child cut them into: 1/4, 1/2, 1/3.
7. Remind your child: L is 50, C is 100, D is 500, M is 1000.
8. Count by hundreds in Roman numerals 100 ___, 200 ___, 300 ___, 400 ___, 500 ___, 600 ___, 700 ___, 800 ___, 900 ___, 1000 ___.
9. Have your child draw circles. Then shade fractions 1/4, 2/4, 1/6, 3/4, 7/8.

10. Have your child write a decimal for a fraction.

$\frac{50}{100}=0.50$ $\frac{42}{100}=0.42$

11. (a) Starting at 6 count 7 more; (b) starting at 8 count 7 less; (c) starting at 9 count 6 less. Can you make up some?

12. Have your child write the last 4 digits of several telephone numbers in the standard form. Then write each as a number word. 8361-eight thousand, three hundred and sixty-one.

13. Have your child pick a number, add 10, multiply the sum by 2, divide the product by 4, subtract 5 from the quotient, multiply the difference by 2. What's your answer?

14. 4 Numerator--7 Denominator (4/7). Make up several fractions. Have your child identify the parts of a fraction.

15. Have your child make a clock face. Use a paper plate. Write the numbers in the Roman system.

16. Draw pictures of circles showing fractions of 1/2, 2/3, 3/4.

17. Find fractional parts of a number. The Davis family made up 1/3 of 15 people at a cookout. How many Davises were there? Example: 1/3 of 15 = ?. Make up 5 more problems.

18. From the stock exchange report in the daily newspaper, have your child circle the denominators of 10 fractions (business section).

19. Have your child write the numerals for the following amounts of money: four dollars and thirty-six cents; eight dollars and two cents; twenty-one dollars and fourteen cents.

20. Give your child an egg carton and 12 buttons. Have him/her put one button in each of 6 sections to show that 6/12=1/2; continue with 9/12=3/4 and 4/12=1/3.

Operations with Numbers

1. Give your child addition facts. Have your child make flash cards for those he/she did not know or counted on fingers.

2. Have your child write the number of: beds ___; tables ___; chairs ___; pillows ___; total ___.

3. Make a list of single digit numbers at random and have your child circle pairs whose sum is 10.

4. Subtract 32 from each of the following numbers: 56, 48, 67, 73. Circle the largest number answer.

5. Have your child fill in a timestable for 2's; then drill him/her on them.

6. Have your child fill in a timestable for 3's; then review 2's, and drill on 3's.

7. Have your child fill in a timestable for 4's; then review 2's, 3's, and drill on 4's.

8. Have your child fill in a timestable for 6's; then review 2's, 3's, 4's, 5's, and drill on 6's.

9. Have your child fill in a timestable for 7's; then review 2's, 3's, 4's, 5's, 6's, and drill on 7's.

10. Have your child fill in a timestable for 8's. Review 2's through 7's, and drill on 8's.

11. Have your child fill in a timestable for 9's. Review 2's through 9's.

12. Use dried beans or small objects. Have your child count out 12. Divide evenly for: 3, 6, 4, 2, and write the problem.

13. Join the stars that have the same sum:

3 + 10 *	* 7 + 9
4 + 12 *	* 7 + 3
10 + 6 *	* 8 + 8
9 + 7 *	* 6 + 6

14. Have your child select five food items from a newspaper. Add the cost. What would the change be from $20.00.

15. Write two digit sums for 30. Example: 18 + 12, 16 + 14. See how many your child can do.

16. Have your child work on three-stage division: $5\overline{)675}$ $5\overline{)680}$. Do several examples.

17. Work with your child on zero in the quotient.

$$6\overline{)612} \qquad 9\overline{)941}$$

18. Use basketball scores from a newspaper to review your child's math skills. Example: 10 games played; 5 wins. How many losses? 7 wins + 7 losses. How many games played?

19. Add two, two-digit numbers. Regroup the ones.

$$\begin{array}{r} 54 \\ +36 \\ \hline 0 \end{array} \qquad \begin{array}{r} 63 \\ +27 \\ \hline 0 \end{array}$$

Can you make up 5 problems?

20. List the combinations of any 3 numbers that can be rewritten to give the sum of 20. Example:

$$\begin{array}{r} 10 \\ 6 \\ +4 \\ \hline 20 \end{array} \qquad \begin{array}{r} 8 \\ 8 \\ +4 \\ \hline 20 \end{array}$$

21. Have your child count by fives - 5, 10, 15, 20. Write related multiplication facts and division facts. Example: $4 \times 5 = 20$, $20 \div 5 = 4$.

22. Make multiplication and division flash cards for speed drills.

23. Have your child write the first 4 digits of telephone numbers of several friends. Have him/her multiply the first 3 digits by the 4th number. Example 248 3 248 x 3.

24. Jane used her calculator to add up her savings. $10.60 + 8.75 + $9.46. What is her total? Use your calculator.

25. Have your child locate the prices of two cars in the classified section of the newspaper. Subtract the smaller number from the larger.

Geometry and Measurement

1. Have your child write a list of household items to compare size. Example: Small--spoon; Medium--lamp; Large--stove.

2. Have your child make a chart to show the number of books he reads each month.

3. Help your child measure the family height and weight (if scales are available). Keep records and measure again in June to check growth.

4. Draw four clocks. Have them show waking up time, school dismissal, dinner time, bedtime.

5. Have your child mark how each hour of the day is used. Be sure it adds up to 24 hours.

6. Help your child record the high and low temperature on paper for the next two weeks to discover how it changes.

7. Perimeter is the distance around a shape. Have your child measure the lengths of the four sides of a door, a book, and a window. Add the lengths of each side to get the perimeter of each.

8. Use graph paper or draw shapes to show area: 6 square units, 8 square units.

9. See if your child can say the months in order. Also learn to spell and write the abbreviations.

10. Have your child draw some clocks and show these times: 3:10, 12:30, 10:15. Practice others.

11. Using the following facts, have your child make a bar graph.
Favorite Ice Cream
5 like chocolate
6 like strawberry
7 like vanilla

12. Have your child take his/her temperature and read the thermometer.

13. Let your child bake cookies. Did he/she measure properly?

14. Have your child find the length and the width of a newspaper in inches. Have him/her tell you the measurements.

15. Have your child look at a clock and tell when it is 10 after the hour, 10 minutes after the half hour, and 10 minutes until the next hour.

16. Watch a TV program with your child. Have him/her tell to the nearest five minutes when each commercial begins.

17. Have your child make a bar graph showing the number of shirts each family member has.

Problem Solving

1. Have your child look at prices on any grocery items. Ask what coins are needed to add up to the price of each item.

2. Have your child follow the pattern and fill in:
40, 35, ___, 25, 20, ___. ___, 59, 56, 53, ___, 47, ___.
81, 79, ___, ___, ___, 73, ___. 40, 36, ___, ___, 24.

3. Make a list of ten numbers for your child to write from least to greatest.

4. Put a variety of coins on the table. Put food with prices on table. Have your child "buy" the items by giving you the correct coins.

5. Write a list of 20 numbers. Have your child write what comes before and after each number.

6. Have your child guess how much each family member weighs. Compare his/her guess with correct answer.

7. Use receipts from purchased items for your child to add together. Check the answers.

8. Have your child draw a new outfit. By each part write what he/she thinks it will cost and what size it should be.

9. Have your child cut out priced grocery items from newspapers and arrange them in order from least to greatest amount.

10. Round to the nearest ten. 118 120; 67 ___; 905 ___; 54 ___; 784 ___; 14 ___; 434 ___; 47 ___; 72 ___; 782 ___; 81 ___; 88 ___. You make up others.

11. Problem: A shepherd has 17 sheep. All but nine died. How many were left? Answer: nine

12. Ask your child which is correct: 8 and 8 are 15, or 8 and 8 is 15. Answer: neither; 8 and 8 are 16.

13. Draw nine small circles on a piece of paper, three circles to a row. Write the 9 even numbers from 2-18 in the circles so that in both rows and columns the numbers add up to 30.

14. Nine volleyballs were on the rack. 7 more are added. How many volleyballs are on the rack? Give a subtraction story using these numbers. Make up two other related stories.

15. Check house numbers in your neighborhood and round the number to the nearest hundred. Example: 236 = 200, 6418 = 6400.

16. Let your child count the money spent for a tree that costs $15.67. Have him/her name the dollars and give the name and number of coins used.

17. At each table there are 4 people. There are 2 tables, how many people? Example: 2 x 4 = 8. Change your numbers and do 4 more.

18. Reflectors for cars cost 59¢ each. We can estimate the cost of 5 reflectors if we do not need an exact amount. (Clue: 59¢ rounded to 60) Multiply x 5. What is your answer?

19. Have your child tell which is greater: 3/8 or 8/8; 7/16 or 5/16; 0/12 or 10/12; 23/50 or 32/50; 4/9 or 7/9; 89/100 or 98/100.

20. Complete the number pattern: 1, 7, 13, 19, 25, ___, ___, ___. The rule is: add ___ to each number to find the next.

21. Take your child shopping. You have $15.00. Estimate the cost of these items. (Round to the nearest dollar.)

Example:	Hat	$3.99 - $4.00
	Belt	$2.65 - $.
	Socks	$ .89 - $.
	Shirt	$6.37 - $.

Do you have enough money?

Children's Books - Grades 3 through 6

Numbers, Numeration, and Counting

1. Andrews, F. Emerson. Numbers Please. Illustrated by Aldren A. Watson. Boston: Little, Brown and Company, 1961. (Stories and information about numbers, unusual ways to do computation, and number tricks to try.)

2. Froman, Robert. Less Than Nothing Is Really Something. New York: Thomas Y. Crowell Company, 1973. (Introduction to negative numbers, including money, temperature, countdowns, and ocean depths as examples. Counter and number lines used to play games.)

3. Russell, Solveig Paulson. One, Two, Three, and Many. Illustrated by Margot Tomes. New York: Henry Z. Walck, Inc., 1970. (Origins of numbers and development of counting tools: abacus, calculator, computer.)

4. St. John, Gloria. How to Count Like a Martian. New York: Henry Z. Walck, Inc., 1975. (Shows different ways to count.

5. Wyler, Rose, and Ames, Gerald. Funny Number Tricks. Illustrated by Stubis Talivaldis. New York: Parents' Magazine Press, 1976. (Riddles and magic tricks using numbers, dominoes, cards, and other props to help children think logically.)

Geometry and Measurement

1. Ellison, Elsie C. Fun With Lines and Curves. Illustrated by Corydon Bell. New York: Viking Press, 1965. (Shows how to construct string sculptures, curve stitching and line drawings from simple curves to the three-dimensional effect.)

2. Froman, Robert. Rubber Bands, Baseballs, and Doughnuts. Illustrated by Harvey Weiss. New York: Thomas Y. Crowell Company, 1972. (Definition of topology simply explained with examples.)

3. Juster, Norton. The Dot and the Line. New York: Random House, 1963. (A mathematical fable of a line whose romantic feelings for a dot are in vain until he turns himself into a ellipse, circles and complex curves.)

4. Phillips, Jo. Exploring Triangles. Illustrated by Jim Rolling. New York: Thomas Y. Crowell Company, 1975. (Paper folding with triangles to illustrate various properties.)

5. Read, Ronald C. Tangrams. New York: Dover Publications, 1965. (Tangram puzzles ranging from simple to complex.)

6. Sitomer, Mindel and Harry. Spirals. Illustrated by Pam Makie. New York: Thomas Y. Crowell Company, 1974. (Shows how to draw on graph paper, the uses of spirals, games to play with spiral boards, etc.)

7. Srivastava, Jane. Averages. Illustrated by Aliki. New York: Thomas Y. Crowell Company, 1975. (Descriptions and illustrations of mean, median, and mode. Shows how everyone is both average and different.)

Problem solving

1. Adler, Peggy and Irving. Math Puzzles. Illustrated by Peggy Adler. New York: Franklin Watts, 1978. (Challenging puzzle problems and nonroutine word problems.)

2. Benedick, Jeanne, and Levin, Marcia. Mathematics Illustrated Dictionary. New York: McGraw-Hill Book Company, 1965. (Dictionary of famous mathematicians and and brief, simplified explanations of terms.)

3. Burns, Marilyn. The I Hate Mathematics Book. Illustrated by Martha Hairston. Boston: Little, Brown and Company, 1975. (Relates everyday activities to mathematics. Contains puzzles, tricks and riddles. Fun and highly motivating.)

4. Kadesch, Robert R. Math Menagerie. Illustrated by Mark Binn. New York: Harper and Row, 1970. (Explores constructions and puzzles relating to probability and geometry, presents topological puzzles and transformations, and stimulates thinking about practical applications.)

5. McWhirter, Norris. Guinness Sports Record Books. New York: Sterling Publishing Company, 1979. (Annual sports records and numerical facts.)

6. O'Neill, Mary. Take a Number. Illustrated by Al Nagy. Garden City, New York: Doubleday and Company, 1968. (Mathematical terms described with poetic license in this combination of math and literature.)

7. Pallas, Norvin. Calculator Puzzles, Tricks, and Games. Illustrated by Joyce Behr. New York: Sterling Publishing Company, 1976. (Puzzles and games to motivate students to think about why they work, and patterns explored.)

8. Rothman, Joel. Which One Is Different? Illustrated by Seymour Chwast and Victor Kotowitz. Garden City, New York: Doubleday and Company, 1975. (Exercises in which careful discrimination leads to the correct answer.)

AWARENESS AND MASTERY RESOURCES

GRADES 7 THROUGH 12

General Activities

You should recall that, by this time, children have already been exposed to most of the basic math skills they will learn. Now they must try to apply these ideas to problem-solving situations while reinforcing their mastery of the basic facts. Furthermore, abstraction is becoming an everyday process. So you will see, in the following activities, many ideas previously introduced with an abundance of problem-solving situations. Feel free to improvise and make up your own problems. When it comes to applications, experience is the best teacher.

Numbers, Numerations, and Counting

1. Write down these numbers: 1, 2, 3, 4, 5, 6, 7, 8. Have your child arrange these numbers in different orders to make ten large numbers. Have him/her read these numbers to you.
2. Have your child measure the growth of several plants each week. Record the information.
3. Have your child round to the nearest hundred the numerals in the area codes found in the phone book.
4. Help your child figure out how many miles you drive in the family car.
5. Have your child make a calendar for one month or the whole year using Roman Numerals.
6. Write fractions on cards, one to a card. Have your child select only two cards and multiply the fractions.
7. Have your child find ten examples of decimals from product labels. Then list the decimals and show fractional equivalents for each.
8. Call out various decimal numbers and have your child write them.
9. Using the TV schedule, have your child count the number of news, sports, comedy, and detective shows that are listed today.

10. Make cards with mixed numbers (3 3/4) on one side and their fractions (15/4) on the other. Have your child select a card, write the fraction, and then turn it over to check.

11. Have your child use a calculator to write the following fractions as decimals.

    25/82 64/115 99/746

12. Find the figures for the National Debt on the financial page of the newspaper. Have your child read these figures to you.

13. Have your child make a list of ten stocks and their prices from the financial section of the newspaper. If the price has changed find the difference.

14. Have your child figure his/her batting average. Divide the number of hits by the number of times at bat.

15. Using a catalog, have your child find 10 items and figure out the cost of the items when the store puts them on sale at 1/4 off.

Operations with Numbers

1. Have your child find the birth announcements in the newspaper. Were there more girls or boys born on a given day?

2. Give your child ten pennies and have him/her write the dates from each one in a column. Add.

3. Have your child add the ages of the family members and divide this total by the number of people in the family.

4. Select five famous dates (1492, etc.). Have your child figure out by substracting how many years ago the event took place.

5. George Washington was born in 1732. Have your child figure out in what year he celebrated his thirty-seventh birthday.

6. If fencing costs 54¢ a foot, have your child calculate how much it would cost to fence your yard.

7. Find the cost of carpet from a catalog. Have your child figure the cost of putting carpet in his/her bedroom. Area times the cost.

8. Use the phone book. Have your child compute the cost of a long distance call from your town to three other cities.

9. Have your child count by a given number (7, 14, 21...). Stop counting when nine times the number is reached.

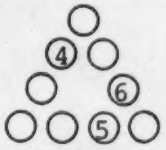
Geometry and Measurement

1. Have your child find an example of a graph. Determine whether it is a bar, circle, or line graph.
2. Have your child answer this question: If your temperature is normal, is it 96, 98.6, or 99.6?
3. Have your child measure and figure the perimeter of part of your yard to be fenced. Perimeter = side + side + side + side
4. Have your child measure the distance around such objects as a steering wheel, waste basket, coin, bowl, and wagon wheel by using a piece of string and ruler.
5. Use graph paper and draw a number of rectangles. Have your child list the area of each figure by counting the squares.
6. Have your child keep a record of the exact amount of time spent at different activities during the day.
7. Have your child measure and figure out the area of a wall for wallpaper. Area = Length x Width.
8. Have your child compute the number of hours and minutes that comedy shows are shown on TV on a given day.
9. Have your child make a scale drawing or diagram of his/her bedroom. 1 inch = 1 foot.
10. Have your child cut out of the Sunday newspaper floor plans of model homes. Compute the amount of floor space of each room in the house. Area = Length x Width.

Problem Solving

1. Have your child find numbers in the newspaper and decide if they are exact or rounded.
2. Have your child answer this question: Paul is four years older than Rose. In two years, he will be twice as old as Rose. How old is Rose now?
3. Have your child keep a record of the high temperature for each day this week. Add these numbers then divide by seven.
4. Have your child answer this question. How many pennies would you need to make $10?

5. Have your child fill in the circles with 1, 2, 3, 7, 8, 9 so that the sum of each side equals twenty.



6. Have your child figure out the next numbers in the pattern. 18, 36, 54, 72, ___, ___, ___.

7. Have your child compute a four-mile cab ride. The fare is $1.60 the first mile and $1 each additional mile.

8. Have your child answer this question: If it is 10:00 a.m. in New York City, what time is it in Los Angeles?
   7:00 a.m. 9:00 a.m. 8:00 a.m.

9. Ask your child why this problem can't be solved. Mark got up at 7:00 a.m. How many hours did he sleep?

10. Use a grocery store cash receipt. Have your child round each price to the nearest dime. Add and compare totals.

11. Have your child select six grocery items. Using the newspaper compare the prices at different stores for these items.

12. Have your child make a list of items to buy from a catalog. Using a 4% sales tax, calculate the total cost of all items including the tax.

13. Have your child compute the cost of five want ads if each line costs $1.38.

14. Julius Caesar was assassinated in 44 B.C. How many years ago was this?

15. Have your child determine what percentage of the TV day is devoted to quiz shows.

16. Have your child figure the amount in a savings account at the end of one year. $100 at 6% simple interest.

17. Have your child answer this question. The sum of three consecutive numbers is 183. What is the smallest of these numbers?

Children's Books - Grades 7 through 12

Numbers, Numerations, and Counting

1. Adler, Irving. Integers. New York: John Day Company, 1972. (Introduction to integers through games, thermometer, number line, atoms, and money.)

2. Asimov, Isaac. How Did We Find Out About Numbers? Illustrated by David Nivins. New York: Walker and Company, 1973. (An account of word derivations and the development of numbers. Shows relationship of numbers and alphabet, the study of numerology, and the simplicity and logic of Hindu-Arabic systems.)

3. Barr, George. Entertaining With Number Tricks. Illustrated by Mildred Waltrip. New York: McGraw-Hill Book Company, 1971. (Includes showmanship, number tricks, secret codes, unusual ways to add, card tricks, magic squares, and guessing games.)

4. Cutter, Ann. Instant Math. Garden City, New Jersey: Doubleday and Company, 1962. (Proponent of Trachtenberg Speed System of Basic Mathematics. Describes how computations can be quickly done through knowledge of patterns.)

5. Froman, Robert. Venn Diagrams. Illustrated by Jan Pyk. New York: Thomas Y. Crowell Company, 1972. (Shows how to use Venn diagrams to sort and keep track of information. Gives activities and practical application of set intersection.)

6. Linn, Charles F. Estimation. Illustrated by Donn Madden. New York: Thomas Y. Crowell Company, 1970. (Tells the importance of estimating and how to make good estimates. Gives situations to use.)

7. Weiss, Malcolm E. 666 Jellybeans! All That? Illustrated by Judith Corwin. New York: Thomas Y. Crowell Company, 1976. (Introduces algebra and shows how to solve puzzles through arithmetic sentences with unknowns.)

Geometry and Measurement

1. Ravielli, Anthony. An Adventure in Geometry. New York: Viking Press, 1961. (Discusses geometry in nature, including projections, distortions, variations of basic shapes, etc.)

2. Sitomer, Mindel and Harry. Circles. Illustrated by George Giusti. New York: Thomas Y. Crowell Company, 1971. (Includes concept of "square" corner, beginning constructions with compass, radius, diameter, semicircles, etc.)

Calculators and Computers

1. Scrivastava, Jane. Statistics. Illustrated by Aliki. New York: Thomas Y. Crowell Company, 1975. (Tells how to take a poll and record information on a bar, circle, line or picto-graph. Shows how statistics can be misleading.)

Problem Solving

1. DeRossi, Claude J. Computers, Tools for Today. Chicago: Children's Press, 1972. (Introduction to computers. Includes base two, flow charting and debugging programs.)

2. James, Elizabeth, and Barkin, Carol. How to Grow a Hundred Dollars. Illustrated by Joel Schick. New York: Lothrop, Lee and Sheppard Company, 1979. (Arithmetic calculations of a young girl who starts her own business. Economic principles illustrated.)

3. Linn, Charles F. Puzzles, Pattern, and Pastimes. Illustrated by Lou Myers. Garden City, New York: Doubleday and Company, 1969. (Includes ancient and modern puzzles, puzzles to figure out, and directions for games to build.)

4. Merrill, Jean. The Toothpaste Millionaire. Boston: Houghton Mifflin Company, 1972. (Adventures of a 12-year-old boy and his rise in the business world. Includes concepts of money, profit, percentage, interest and economics principles.)

5. Olney, Ross and Pat. Pocket Calculator Fun and Games. Illustrated by Gretchen Lopez. New York: Franklin Watts, 1977. (Simple but thorough description of how calculators work. Includes games and riddles.)

RESOURCES FOR ADULTS

RESOURCES FOR ADULTS

Remember that in the last 15 years some changes have taken place in the teaching of mathematics. In addition, computers have become more prevalent in our society. The following books may give you some helpful information either for your personal benefit or in helping your child with his/her mathematics.

1. Broudy, Rose L. Modern Math Made Easy. Irvington-on-Hudson, New Jersey: Harvey House, 1970. (Explanation of properties, sets, bases, primes, modular arithmetic, etc. Includes glossary of terms and bibliography.)

2. Holt, Michael, and Dienes, Zoltan. Let's Play Math. New York: Walker and Company, 1973. (Introduction on how children learn math and current philosophy of math education. Suggestions to improve logical capacity of children. Games providing foundation for later math concepts of symmetry, rotation, relations, ordering, time, patterns, etc.)

3. Linn, Charles F. Odd Angles. Garden City, New York: Doubleday and Company, 1971. (Literature related to mathematics by Carl Sandburg, Ben Franklin, Mark Twain, Art Buchwald, Lewis Carroll, Isaac Asimov, and Charles Linn. Quatrains and limericks reproduced. Designed for those who are disinclined toward mathematics.)

4. Schlossberg, Edwin, Brockmand, John, and Horton, Lyn. The Home Computer Handbook. New York: Sterling Publishing Company, 1978. (Describes what computers are and how they work. Includes glossary, bibliography and buying guide.)

Summary

As a parent, you are a valuable resource for your child's classroom teacher. One of the most valuable services you can provide, as your child grows older, is a continued concern and a willingness to help with your child's mathematical development. The most helpful efforts will be those which foster a relaxed, comfortable, and supportive attitude toward a subject which has traditionally caused frustration and apprehension. Parents who create a positive environment in the home, parents who remain aware of their child's interests, parents who communicate and share with their children will also share in the growth, success, and progress their child experiences.

Division of Reading Effectiveness

Mailing Address:
Room 229, State House
Indianapolis, Indiana 46204

Office Location:
3833 N. Meridian St.
Indianapolis
Phone: 317/927-0194